

Solvent extraction of rare earths

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The distribution coefficient of a metal ion, M, D_M (sometimes designated as K), particularly in earlier literature, is given by:

$$D_M = \frac{[\overline{M}]}{[M]} = K$$

where $[\overline{M}]$ is the molar concentration of M in the organic phase and [M] is the concentration in the aqueous phase. The separation factor of two different metal ions, M_1 and M_2 , $\beta_{M1/M2}$, is defined as:

$$\beta_{M1/M2} = \frac{D_{M1}}{D_{M2}}$$

[...] The selectivity order for extracting rare earths from 0.5 M HCl solution with 0.75 M D2EHPA* in toluene was Lu > Yb > Tm > Tb > Eu > Pm > Pr > Ce > La (Peppard and Wason, 1961), with the log of the **distribution coefficient** (called log K by Peppard et al. (1957a,b)) increasing linearly with the atomic number, Z, of the rare earth.

* D2EHPA = HDEHP = di-(2-ethylhexyl) phosphoric acid

